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Title: Readmission and mortality after first hospital admission with acute hypercapnic respiratory failure (AHRF) requiring non-invasive ventilation (NIV)

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Body: Introduction: Longer term data on mortality of patients requiring NIV due to AHRF have been reported (Thomas A et al. ERJ 2010; 36:54. 402s). We report 1-year mortality and readmission rates of a cohort of such patients admitted to a respiratory ward-based 11-bedded physiotherapy-led NIV unit in a hospital providing acute medical services to a population of about 450000. Methods: An observational, single-centre, retrospective, follow-up study of all patients requiring NIV for AHRF (Arterial pH 7.35 and pCO₂ 6.0 kPa) for the first time between 01 Jan 2009 to 31 Dec 2009 was conducted. Results: Of the 163 patients treated with NIV, data was complete on 149. Mean pH 7.21; mean FEV₁ 21% predicted. The most common cause for admission was exacerbation of COPD 76 (51%), followed by pneumonia 22 (14.7%), Primary obese morbidity 13 (8.7%), left ventricular failure 6 (4.02%) and Multifactorial AHRF 32 (21.4%); Mortality at first admission was 38/149 (25.5%) and at 24 months was 86/149 (57.7%). Readmission for AHRF peaked at 1 year, with 32.9% of patients being readmitted at least once at 12 months after first presentation. Discussion: Respiratory ward based NIV units in UK teaching hospitals tend to treat significantly more acidotic patients in real life than envisaged by the British Thoracic Society/Royal College of Physicians/Intensive Care Society 2008 guidelines. Allowing for that, short term (1-year) mortality and readmission rates remain similar to original studies on less severely acidotic AHRF patients, which probably indicates improved multidisciplinary team work and team learning.